RP-29

1

REFERENCE PUBLICATION

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THE ACOUSTIC REFERENCE SERVICE

A SUBSET OF THE OCEANOGRAPHIC MANAGEMENT INFORMATION SYSTEM

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FOREWORD

The Naval Oceanographic Office is developing an Oceanographic Management Information System to support both administrative and technical endeavors of the Naval oceanographic community. The Acoustic Reference Service is that subset which identifies acoustic measurement efforts and supporting environmental observations. The scope of this task, like that of previous compilations, is not modest. Correspondingly, its value, if properly exercised, can be measured in many dollars, much time, and more comprehensive products for Fleet support. I solicit both your utilization and contribution to this computerized service.

W.C. PALMER
Captain, USN
Commanding Officer

UNCLASSIFIED

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Reverberation Level
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Target/Signal Detection

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The Acoustic Reference Service (ARS) is a recent endeavor utilizing Naval Oceanographic Office (NAVOCEANO) computer facilities to contribute a dynamic inventory of underwater acoustic data and associated environmental measurements. This system is intended to provide the Oceanographer of the Navy, (ON), the Commander Naval Oceanography Command (COMNAVOCEANCOM), their staffs and subordinate commands with a common link to information concerning the existence, density, location and status of acoustic data.

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Acknowledgements

As of this writing, the Acoustic Reference Service consists of contributions from 180 organizations and includes the works of 445 principal researchers. Original credit for the ARS design lies with NORDA (Code 115), specifically CDR T.J. McCloskey and S.F. Wasowski. The initial compilation was done by Dr. M.R. Bradley of PLANNING SYSTEMS INCORPORATED.

The intricacies of CREATABASE were handled most masterfully by Mr. R.F. Garrard of DANIEL ANALYTICAL SERVICES, INCORPORATED. Special appreciation is due Messrs. Roger Merrifield and K.M. Sherman for their review of NAVOCEANO acoustic surveys conducted under Mr. W.H. Geddes and more recently under Dr. William Jobst.

My thanks to each individual who has used the ARS and offered his or her suggestions for its improvement.

Introduction

The need to share acoustic and oceanographic data has been long recognized at all levels. The Naval Sea Systems Underwater Acoustic Data Bank (NAVDAB), the Naval Ocean Systems Center (NOSC) Underwater Acoustic Inventory Referral System (NUAIRS), and the Acoustic Environmental Support Detachment (AESD) Computerized Ambient Noise Bibliography, characterize previous undertakings. Consideration of these as well as the Long Range Acoustic Propagation Project (LRAPP) Environmental Acoustic Data Bank are reflected in the design and content of the ARS.

To be useful, an information system must be vibrant. As applications evolve, the system must respond with changes in structure, content, and organization. The initial development work on ARS was delivered to COMNAVOCEANCOM in December 1979. Since that date, the data base has doubled in record number, new routines have been added, and further segmentation has reduced its storage requirements.

The purpose of this publication is to provide insight into the content and capabilities of the ARS. Additionally, these instructions will permit the typical computer user to access the ARS system.

A Subject Matter Specialist or "man-in-the-loop" is available for technical assistance, classified queries, mail or telephone requests. User participation, information input, and feedback to make the system more responsive are encouraged.

2.1 Capabilities

The ARS is designed to enable a quick, thorough, authoritative research of accomplished, pending, and planned acoustic measurements plus ancillary environmental observations. The system contains information from all sectors of the acoustic community, foreign and domestic. Updates are made at least weekly by the Subject Matter Specialist of the Oceanographic Management Information System (OMIS) staff. Information is obtained through personal contact and routine review of messages, documents, and journals, as well as through several automated bibliographic services such as Defense Technical Information Center (DTIC) and National Technical Information Service (NTIS).

Although no actual acoustic data are present within the reference service, the system reveals the existence of scientific papers, technical reports, models and data bases where the data may be found. Point-of-contact information includes cognizant person or author, agency, sponsor, telephone number and address.

Other descriptive items embrace type of measurement, frequencies, operation dates, coordinates, and geographic area. These items plus additional items concerning the equipment and techniques employed comprise the basic entries shown in figure 1.

In operation the software acts upon two internal files. A compressed file of coded entries is referenced to a dictionary file of descriptor states.

1. REPORT CONTROL NUMBER
2. SUMMARY SECURITY
3. WORK SECURITY
4. MEASUREMENT TYPE 1
5. MEASUREMENT TYPE 2
6. MEASUREMENT TYPE 3
7. MEASUREMENT TYPE 4
8. BEGIN DATE
9. END DATE
10. S.BOUND
11. N.BOUND
12. W.BOUND
13. E.BOUND
14. GENERAL LOCATION
15. SPECIFIC LOCATION
16. COGNIZANT PERSON
17. COGNIZANT ORGANIZATION
18. COG.PHONE
19. SPONSOR
20. FREQUENCY 1
21. FREQUENCY 2
22. FREQUENCY 3
23. FREQUENCY 4
24. RECEIVER 1
25. RECEIVER 2
26. RECEIVER 3
27. RECEIVER DEPTH 1
28. RECEIVER DEPTH 2
29. SOURCE 1
30. SOURCE 2
31. SOURCE 3
32. SOURCE DEPTH 1
33. ENVIRONMENTAL DATA 1
34. ENVIRONMENTAL DATA 2
35. ENVIRONMENTAL DATA 3
36. ENVIRONMENTAL DATA 4
37. ENVIRONMENTAL DATA 5
38. EXERCISE NAME
39. OTHER ID
40. REFERENCE DOCUMENT
41. NUMBER OF STATIONS
42. REVIEW
43. VLF
44. LF
45. MF
46. HF
47. VHF
48. MAX WATER DEPTH
49. MIN WATER DEPTH
50. MEASUREMENTS
51. ENVIRONMENTAL DATA
52. COORDINATES

Figure 1 - Basic Entries

RECORD NUMBER 1

1.	REPORT CONTROL NUMBER	= 1649
2.	SUMMARY SECURITY	= U
3.	WORK SECURITY	= U
4.	MEASUREMENT TYPE 1	= REVERBERATION LEVEL
10.	S.BOUND	= 56 DEG.
11.	N.BOUND	= 56 DEG.
12.	W.BOUND	= 3 DEG.
13.	E.BOUND	= 4 DEG.
14.	GENERAL LOCATION	= NORTH ATLANTIC OCEAN
15.	SPECIFIC LOCATION	= NORTH SEA
16.	COGNIZANT PERSON	= WILLIE P.
17.	COGNIZANT ORGANIZATION	= FBWG
19.	SPONSOR	= MOD FRG
20.	FREQUENCY 1	= 400.0 HZ
21.	FREQUENCY 2	= 800.0 HZ
22.	FREQUENCY 3	= 1600.0 HZ
23.	FREQUENCY 4	= 3200.0 HZ
24.	RECEIVER 1	= HYDROPHONE
27.	RECEIVER DEPTH 1	= 20 METERS
29.	SOURCE 1	= SUS CHARGE
33.	ENVIRONMENTAL DATA 1	= SEA STATE
34.	ENVIRONMENTAL DATA 2	= WIND
35.	ENVIRONMENTAL DATA 3	= BOTTOM TYPE
38.	EXERCISE NAME	= RV PLANET
40.	REFERENCE DOCUMENT	= JASA V66 N4 348-353
42.	REVIEW	= SECONDARY
43.	VLF	= NO
44.	LF	= NO
45.	MF	= YES
46.	HF	= YES
47.	VHF	= NO
48.	MAX WATER DEPTH	= 70 METERS
49.	MIN WATER DEPTH	= 60 METERS

JASA V66 N4 348-353
FORSHUNGSANSTALT DER BUNDESWEHR
FUER WASSERSCHALL UND GEOPHYSIK
KAROLINENWEG 22
23 KIEL 1
WEST GERMANY

Figure 2 - Sample Record

Information appearing in items 1-52 are described in the system as descriptor states and may be fully sorted and searched on the computer. These items may be searched singly or in combination through the use of Boolean expressions. A definition of each descriptor is presented on page 24. To assist the casual user with term identification and abbreviations, a Vertical Report is available. The report shown in figure 2 is coupled to a trailing paragraph which spells out titles of reports, addresses, and other contact information. If no information has been input for a given descriptor, number and name will be suppressed in output.

For those with restricted sectors of interest, the ARS may be divided into five major groups of measurement types:

AMBIENT NOISE

TRANSMISSION LOSS

BOTTOM LOSS

REVERBERATION LEVEL

TARGET/SIGNAL DETECTION

The specialized entry routines will access only one group, thereby hastening all activities and sparing computer facilities.

2.2 Access

Both classified and unclassified versions of the ARS are maintained at NAVOCEANO. Access to the secured files will be through the Subject Matter Specialist. Only the unclassified version resident on the UNIVAC-1108 "B" system will be discussed in the following text. Local users are advised to insert the "ARMS" qualifier within their RUN statement.

This computer is presently available by remote line from 0800 to 1700 CST during normal work days. Issuance of new identification codes, passwords, etc. can be coordinated through the OMIS staff at NAVOCEANO. No additional provisions are required for those who already have approval for other OMIS subsets. Valid telephone lines include:

AUTOVON	485-4729
FTS	494-4729
COMMERCIAL	601-688-4729
NSTL EXTENSION	4729

Full LOG-ON procedures will be provided with password issuance. After establishing contact with the computer, the program file should be assigned in this manner:

```
@ASG,A   ARMS*BELL.
```

One of two initialization routines should then be added to open the system:

```
@ADD   ARMS*BELL.WIN
```

which will provide access to the basic report plus the trailing paragraph, shown in figure 2; or

```
@ADD   ARMS*BELL.ALL
```

which will enable only the basic report. Appendix A reveals the system response to normal execution of an entry routine.

If the user desires only one group of measurements, as discussed on page 4 add one of the following statements in lieu of "...WIN" or "...ALL:, i.e.,:

```
@ADD   ARMS*BELL.ARSAN          (ambient noise)
@ADD   ARMS*BELL.ARSTL          (transmission loss)
@ADD   ARMS*BELL.ARSBL          (bottom loss)
@ADD   ARMS*BELL.ARSRL          (reverberation level)
@ADD   ARMS*BELL.ARSMS          (target/signal detection)
```

"MS" was selected for the target/signal detection group as a number of miscellaneous categories such as COHERENCE and ARRAY EVALUATION are included.

2.3 Language

The ARS is maintained through the CREATABASE data management system developed by the DANIEL ANALYTICAL SERVICES CORPORATION. Plain English is translated by the software to interact with a data dictionary and associated compressed file. A full spectrum of commands may be found in references (3), (4), and (8). Only basic syntax and five instructions will be presented in this report. Their basic forms are:

```
DST*        (dictionary structure)
DSQ ...*    (descriptor sequence)
HOW MANY HAVE ...*
SAP ... FOR WITH ...*    (sort and print)
END*                     (exit)
```

Each of our CREATABASE commands will terminate with an asterisk.

Upon entering one of the access routines presented in section 2.2, a series of output lines will appear indicating the status of required files and work space. You will have formally entered CREATABASE and will be ready to enter a query once this line has appeared:

```
THIS IS A DANALYT PROPRIETARY SYSTEM - LEVEL 4G/UNV.
```

The simplest instruction, "DST*", will produce a dictionary list as shown in figure 1. A complete listing of each alphanumeric descriptor state in the data base will result upon entering "DST 2*". It may be desired to list only the descriptor states for a single item such as COGNIZANT PERSON. This may be accomplished with the DSQ command followed by the descriptor sequence number, 16. The sequence numbers can be found in figure 1. Hence you would enter:

```
DSQ 16*
DST 2*
```

These two commands will produce a complete list of authors or other individuals cognizant of the measurements identified in the data base.

Occasionally, a properly worded query will evoke an absurdly lengthy response. To avoid this inconvenience or to answer general questions, the "HOW MANY ..." command may be employed. For example,

```
HOW MANY HAVE COGNIZANT PERSON,WINOKUR R.S.*
```

or

```
HOW MANY HAVE 16,WINOKUR R.S.*
```

Both statements pose the question - "How many records in the data base are attributed to MR. R.S. Winokur?" Accordingly, the system will first echo the question and then reply:

ISOLATIONS	TOTAL	PERCENTAGE
12	1610	.75

More complex query statements may be extended beyond a single line. The Boolean expressions "AND," "OR," "NOT" are used to link conditions. Avoid breaking a phrase such as "MEDITERRANEAN SEA" at the end of a line, as this may insert ambiguous blanks into the specification. The following query statements illustrate complex expressions properly distributed over more than a single line:

```
HOW MANY HAVE MEASUREMENTS,AMBIENT NOISE OR BOTTOM LOSS
AND GENERAL LOCATION,MEDITERRANEAN SEA*
```

or

```
HOW MANY HAVE 50,AMBIENT NOISE AND 14,MEDITERRANEAN SEA
AND NOT 17,NAVOCEANO*
```

The most frequently used command is "SAP ... FOR WITH ...*". This command requires specification of both the items to be output as well as those to be used as selection criteria. A simple request would be "sort and print the names of cognizant persons associated with measurements near Elba Island." In CREATEABASEse, this would be worded for the computer as:

```
SAP 16 FOR WITH 15,ELBA ISLAND*
```

or

```
SORT AND PRINT COGNIZANT PERSON FOR WITH
SPECIFIC LOCATION,ELBA ISLAND*
```

More complex statements may include more than one item in either category and even employ parentheses. Parentheses are positioned about selected items for output on the same line. Therefore,

```
SAP (16,17)15,52,40, FOR WITH N.BOUND,FROM 40 TO 45
AND 50,REVERBERATION LEVEL AND 17,NAVOCEANO
AND W.BOUND,FROM 2 TO 3*
```

will elicit:

```
DAVIS, E.E.          NAVOCEANO
NORWEGIAN SEA
36 DEG
43 DEG
 3 DEG
 4 DEG
NAVO TN 6130-09-73
```

Descriptor 52 is a linkage device which combines decriptor numbers 10, 11, 12, and 13. The output corresponds therefore to south, north, west and east coordinates for the survey area or point.

The "END*" command is used to exit the data management system. This will be answered by an input/output summary which signifies a proper exit. Certain errors will also produce an exit from the information management system. To quickly re-enter the ARS files, the job control language may be summoned in the following manner:

@D$*UC.CAB

This procedure is much faster than the normal entry sequences, but will activate only the last file previously opened. It will not allow the user to pass from the special ambient noise group to the bottom loss group, for instance.

2.4 Reports

It is noted that when a standard "SORT AND PRINT" (SAP) command is used, the desired descriptor states are output without labels. Until one gains familiarity with the ARS output structure, it is quite beneficial to label the output items with descriptor names and numbers. This is accomplished by the CREATABASE Vertical Report writer. This feature, like the graphic routines to be discussed, are FORTRAN subroutines which operate on special external files, called output modules. For simplicity, these routines are summoned through the use of canned runstreams.

If one or more full records with labels are desired, the SELECT element is used. This statement is actually an open end CREATABASE command which specifies all descriptors for output and awaits the user's selection criteria. The following sequence will select the complete record which represents Mr. E.E. Davis's efforts published in NAVOCEANO Technical Note TN 6130-09-73. While operating within CREATABASE, add the SELECT element:

```
@ADD   ARMS*BELL.SELECT
```

Then, after the "FOR WITH" which appears automatically, enter

```
REFERENCE DOCUMENT,NAVO TN 6130-09-73*
```

or

```
40,NAVO TN 6130-09-73*
```

or

```
16,DAVIS E.E. AND 15,NORWEGIAN SEA*
```

and depress the TRANSMIT key.

Next, add one of two output routines:

```
@ADD   ARMS*BELL.FIRE
```

which displays only the basic information and omits the trailing paragraph discussed in section 2.1

or

```
@ADD   ARMS*BELL.SHOW
```

which includes both the basic information and the trailing supplemental paragraph. Caution, ARMS*BELL.SHOW cannot be used with the ARMS*BELL.ALL entrance routine discussed in section 2.2. Other output routines are available and may be requested from the Subject Matter Specialist.

2.5 Plotter Graphics

A full suite of graphics are available within the CREATABASE software. To bring this output option within the grasp of casual users or hurried researchers, a series of standard base charts for principal ocean areas have been prepared. These routines may be used much as the REPORT options discussed in the previous section. The graphic routines offered for the ARS are currently set for CALCOMP model 905 or 915/936 drum plotters. Other devices will be accommodated upon request.

The sample shown below will display low frequency ambient noise measurement locations in the North Atlantic Ocean. This output is shown in figure 4. The appropriate selection criteria are entered in execution of step (2). In general, graphic plots require five instructions, and may be initiated at any stage while in the ARS programs. The user must stage a 7-Track 800 bpi tape. For illustration we will show tape number 13090. Operation is as follows:

(1) @ASG,TJ 24.,U,13090W

(2) @ADD ARMS*DAN.PUSH

Finally, after the "FOR WITH" which appears automatically, enter your selection criteria:

LF,YES AND 50,AMBIENT NOISE AND 14,NORTH ATLANTIC OCEAN

At this point, instead of terminating with the usual asterisk, just depress the transmit button <u>without</u> entering an asterisk, and go directly to step (3).

(3) @ADD ARMS*DAN.PROTECT

(4) @ADD ARMS*DAN.SUPEREGO

Next, enter one of the following statements appropriate to your area of interest:

(5) @ADD ARMS*DAN.ID-NATL (for North Atlantic Ocean)

@ADD ARMS*DAN.ID-MED (for Mediterranean Sea)

@ADD ARMS*DAN.ID-IND (for Indian Ocean)

@ADD ARMS*DAN.ID-WPAC (for West Pacific Ocean)

@ADD ARMS*DAN.ID-EPAC (for East Pacific Ocean)

Several sheets of output are generated in this process. A complete execution of vector graphics is presented in Appendix B. Completion is indicated by the appearance of a plot summary, figure 3.

TAPE BLOCKS 1 THROUGH 5.

OMIS ACOUSTIC REFERENCE SERVICE

PLOT TYPE: MAP.

MAP LIMITS: LATITUDE, FROM 30.000 to 59.721 LONGITUDE, FROM -6.000 to 36.000

FIELD:	1	2	3	4
DATA PLOTTED:	0	0	31	0
OUT OF RANGE:	1	1	0	0

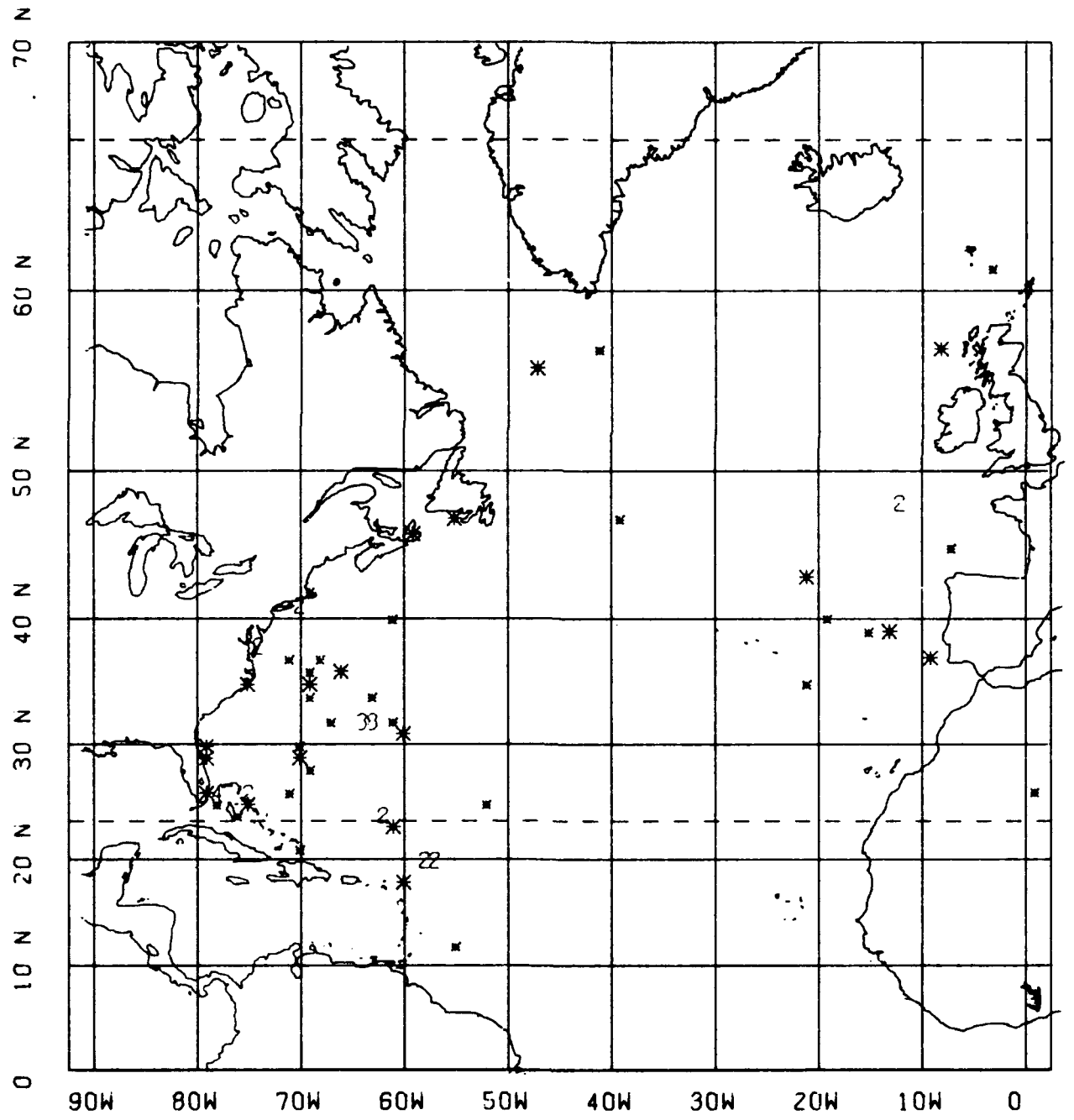
Figure 3 - Plot Summary

The mixed nature of acoustic measurements, as well as the technological developments within the forty years spanned by the ARS, necessitate several judgments in selection of a generalized output form. In figures 4-7, two sizes of asterisks are displayed. The larger corresponds to a single latitude-longitude point observation or one or more measurements confined to a one degree square. The smaller symbol represents a mean center of areal limits reported for a survey region. As such, the smaller asterisk may, on occasion, fall within the coastline of a continent or island.

OMIS ACOUSTIC REFERENCE SERVICE

LEGEND

SCALE: ——— 1000 KM. AT LATITUDE 35N. STANDARD MERCATOR PROJECTION.
INTEGER VARIABLE 3, WITH NO OF RECORDS: =1 * : =2 2 :
=3 3 : =4 4 : =5 5 : =6 6 : =7 7 : =8 8 : =9 9 :35 POINTS.
INTEGER VARIABLE 4, WITH NO OF RECORDS: <10 NO PLOT;
≥10 > :0 POINTS. INTEGER VARIABLE 5, WITH
NO OF RECORDS: =1 *; =2 NO PLOT;18 POINTS.



ACOUSTIC SURVEYS IN NORTH ATLANTIC AREA

DANALYT GRAPHICS, EDC

Figure 4

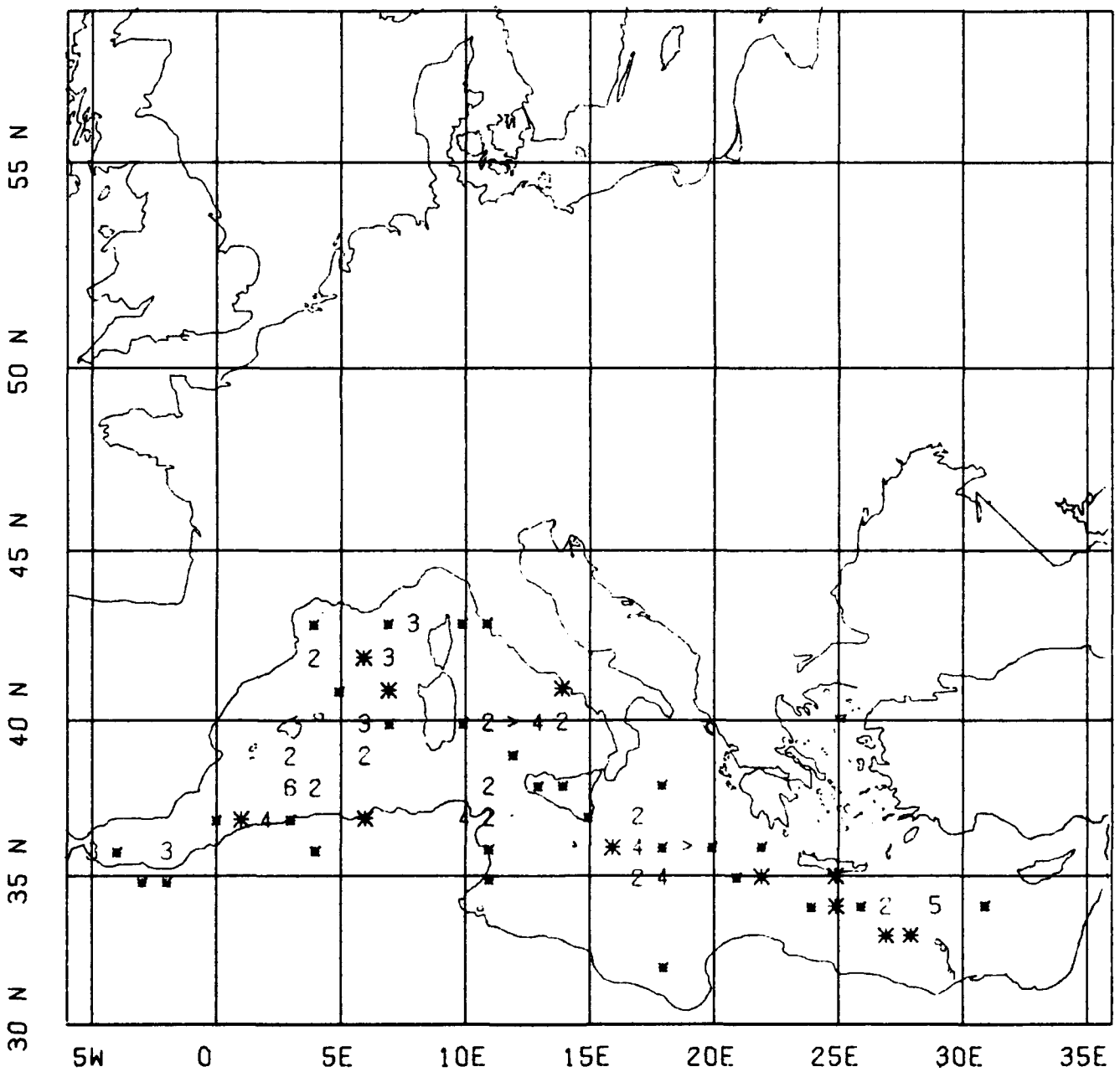
OMIS ACOUSTIC REFERENCE SERVICE

LEGEND

SCALE: ——————— 1000 KM AT LATITUDE 39N STANDARD MERCATER PROJECTION.

INTEGER VARIABLE 3, WITH NO OF DATA RECORDS: =1 ✱ ; =2 2 ; =3 3 ; =4 4 ; =5 5 ; =6 6 ; =7 7 ; =8 8 ; =9 9 ;51 POINTS.

INTEGER VARIABLE 4, WITH NO OF RECORDS: <10 NO PLOT; ≥10 > ;2 POINTS. INTEGER VARIABLE 5, WITH NO OF RECORDS: =1 ✱ ; =2 NO PLOT;11 POINTS.



ACOUSTIC SURVEYS IN THE MEDITERRANEAN SEA

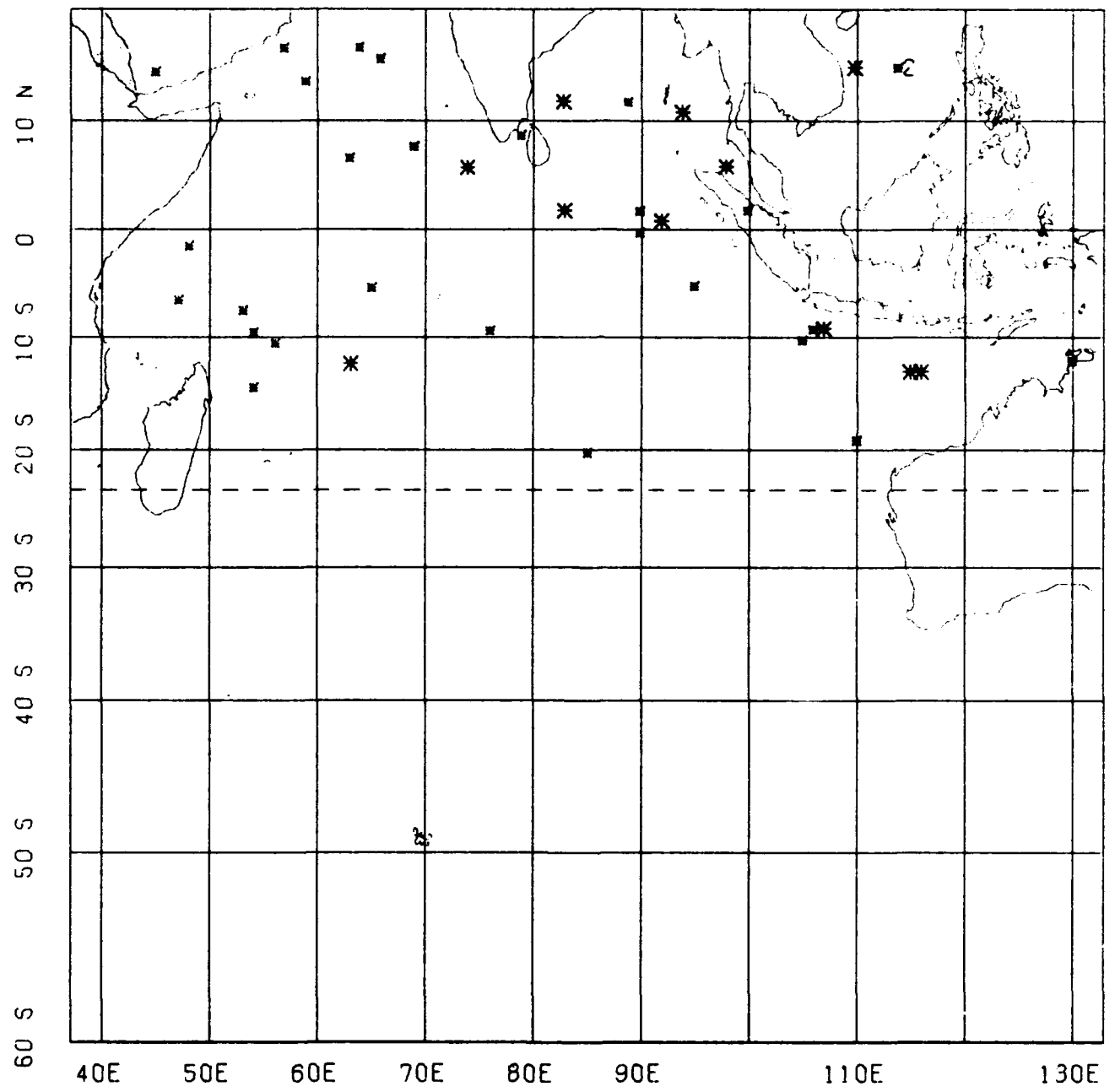
DANALYT GRAPHICS: E30

Figure 5

OMIS ACOUSTIC REFERENCE SERVICE

LEGEND

SCALE: ——— 1000 KM. AT LATITUDE 30N. STANDARD MERCATOR PROJECTION.
INTEGER VARIABLE 3. WITH NO OF DATA RECORDS: =1 ■ : =2 2 :
=3 3 : =4 4 : =5 5 : =6 6 : =7 7 : =8 8 : =9 9 :28 POINTS.
INTEGER VARIABLE 4. WITH NO OF DATA RECORDS: <10 NO PLOT:
≥10 > :0 POINTS. INTEGER VARIABLE 5. WITH
NO OF RECORDS: =1 ✱ : =2 NO PLOT:11 POINTS.



ACOUSTIC SURVEYS IN INDIAN OCEAN AREA

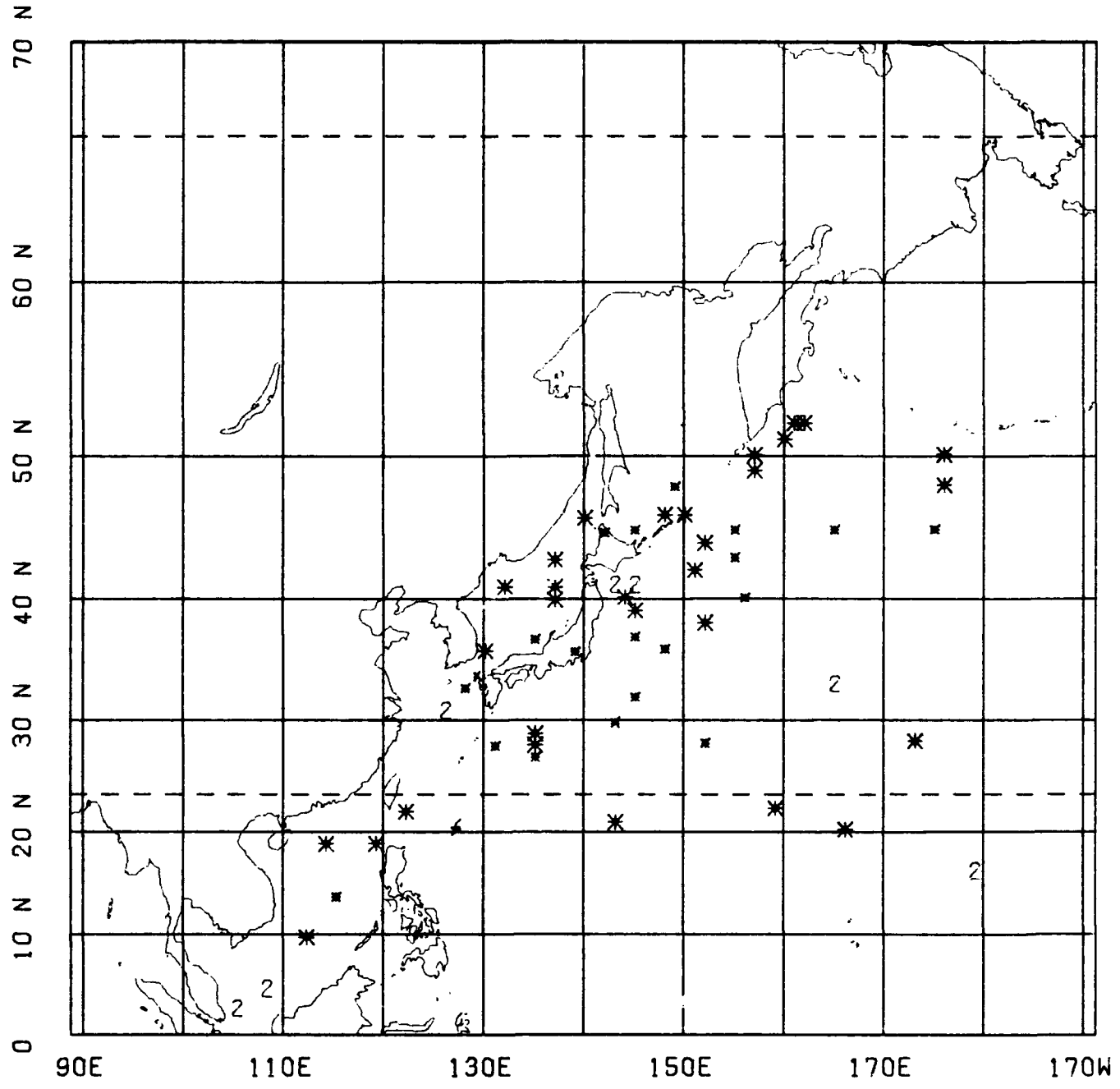
Figure 6

ORNLYT GRAPHICS ESD

OMIS ACOUSTIC REFERENCE SERVICE

LEGEND

SCALE: ——— 1000 KM. AT LATITUDE 35N. STANDARD MERCATOR PROJECTION.
INTEGER VARIABLE 3, WITH NO OF DATA RECORDS: =1 * : =2 2 :
=3 3 : =4 4 : =5 5 : =6 6 : =7 7 : =8 8 : =9 9 :28 POINTS.
INTEGER VARIABLE 4, WITH NO OF DATA RECORDS: <10 NO PLOT:
≥10 > :0 POINTS. INTEGER VARIABLE 5, WITH
NO OF RECORDS: =1 * : =2 NO PLOT:31 POINTS.



ACOUSTIC SURVEYS IN WEST PACIFIC

Figure 7

2.6 Line Printer Graphics

To enable a quick look at survey distribution among oceans and density within a given region, coordinate grids may be rapidly displayed on any computer printer. For convenience, these routines have been canned and sized for standard teletype remote terminal devices, to include:

CD MINITERM
TI SILENT 700
BELL TYPE 43
and others.

After routine entry to the ARS files using any of the statements described in section 2.2, only two statements are needed for this output option. Enter:

(1) @ADD ARMS*DAN.SET

and after the "FOR WITH" which appears automatically, input your selection criteria. For example:

50,BOTTOM LOSS AND 14,SOUTH PACIFIC OCEAN*

Then add one of the following:

(2)	@ADD	ARMS*DAN.MINI-ATL	(for North Atlantic Ocean)
	@ADD	ARMS*DAN.MINI-SATL	(for South Atlantic Ocean)
	@ADD	ARMS*DAN.MINI-MED	(for Mediterranean Sea)
	@ADD	ARMS*DAN.MINI-IND	(for Indian Ocean)
	@ADD	ARMS*DAN.MINI-WPAC	(for Northwest Pacific Ocean)
	@ADD	ARMS*DAN.MINI-SWPAC	(for Southwest Pacific Ocean)
	@ADD	ARMS*DAN.MINI-SEPAC	(for Southeast Pacific Ocean)

Shoreline overlays for these grids will be provided upon request.

The double asterisk representation described in section 2.5 is not available for this option; therefore, the asterisk on these graphics represent both areal and point surveys. Numeric symbols are shown when more than one survey coordinate set occur at the same location. For clarity, when more than nine surveys coincide, a "greater than" sign is displayed. An execution of line printer graphics is presented in Appendix C.

The techniques of line printer graphics are fast, cheap, simple and provide a visual check on the selection criteria used with other ARS output options. Samples are presented in figures 8 through 12. As the ARS is continually being expanded, the user is encouraged not to accept these samples as current.

ACOUSTIC SURVEYS IN MEDITERRANEAN SEA

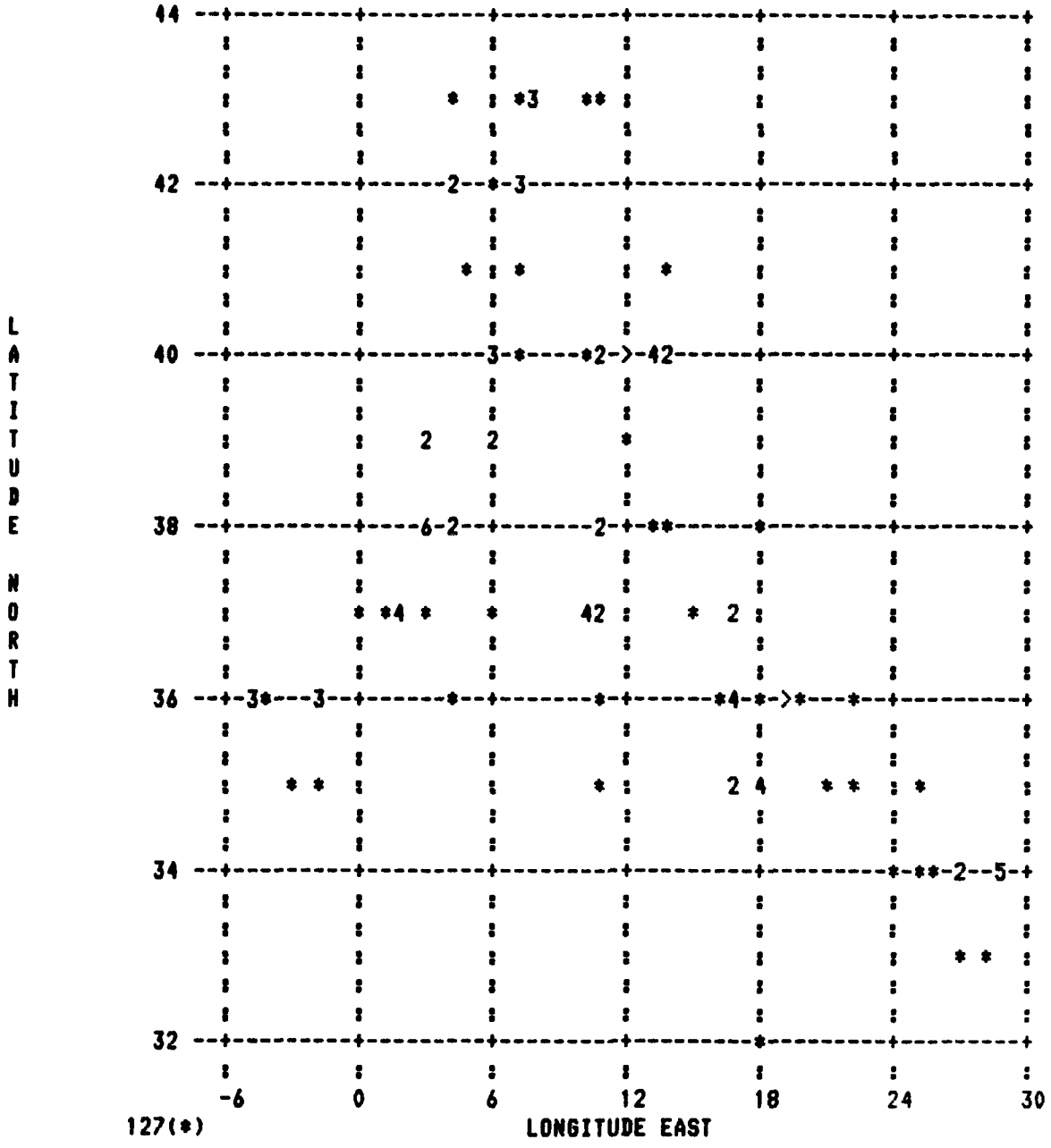


Figure 8

ACOUSTIC SURVEYS IN EAST PACIFIC

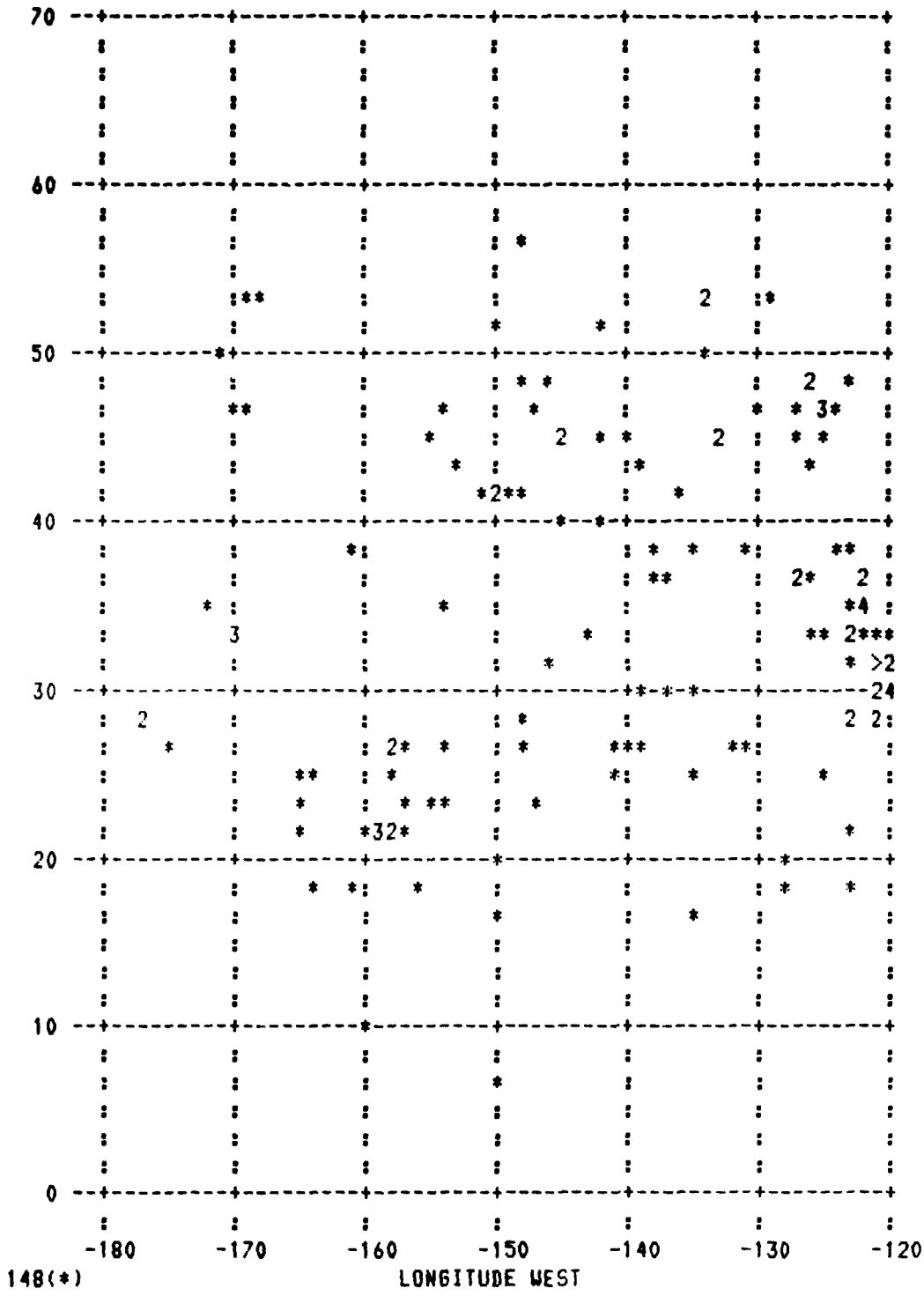


Figure 9

ACOUSTIC SURVEYS IN THE INDIAN OCEAN

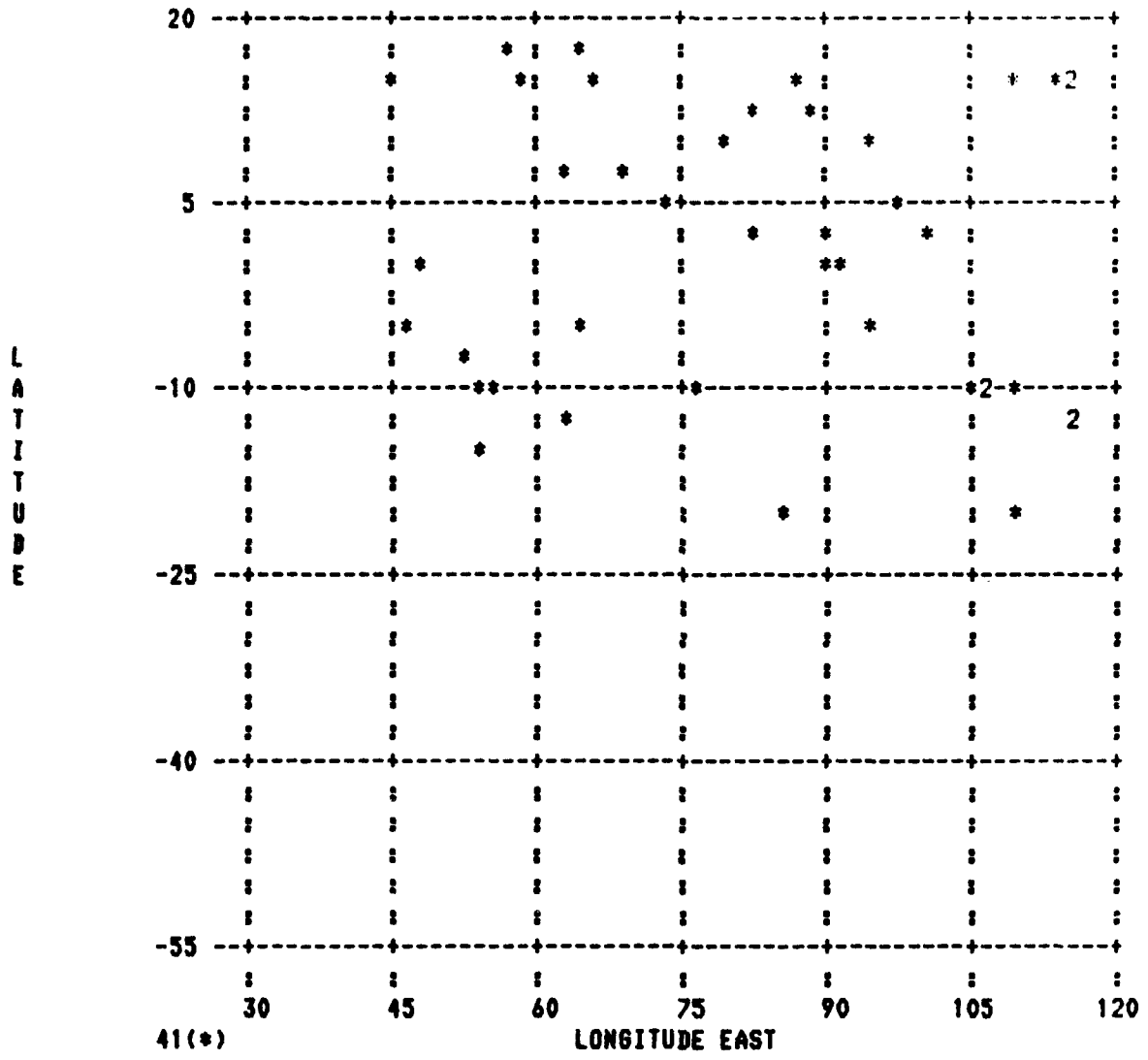


Figure 10

ACOUSTIC SURVEYS IN S-WEST PACIFIC

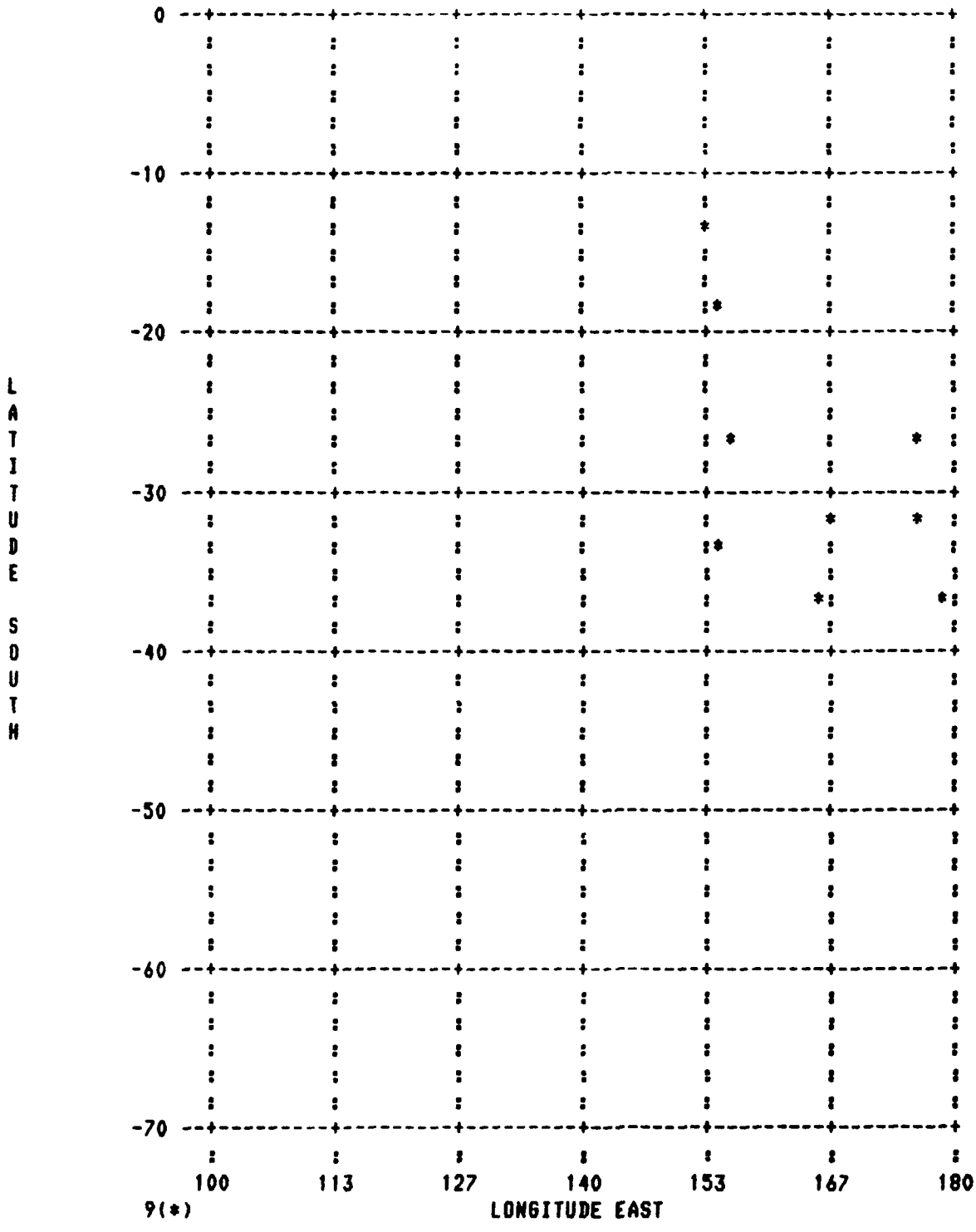


Figure 11

ACOUSTIC SURVEYS IN NORTH ATLANTIC

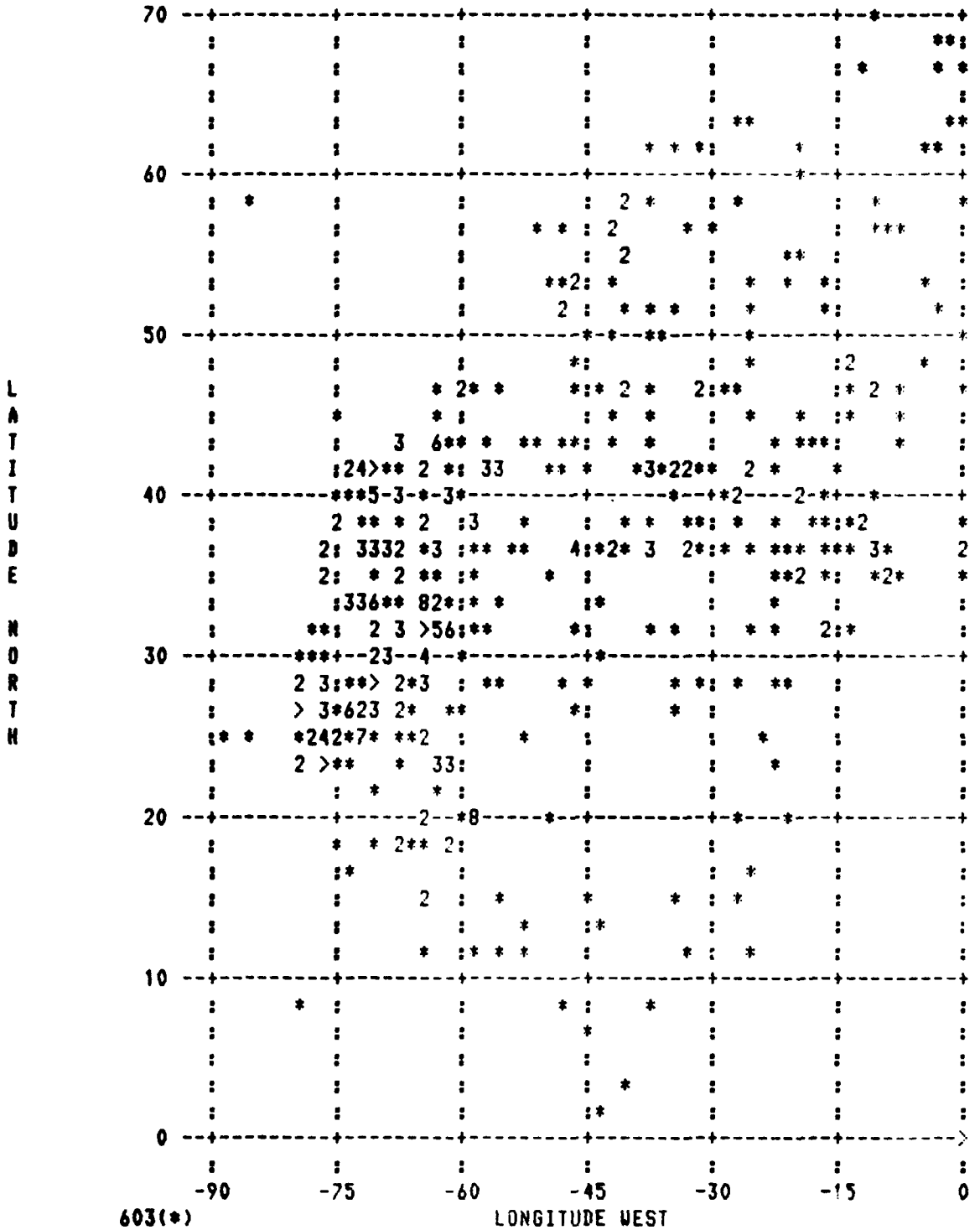


Figure 12

3.0 Conclusions and Recommendations

The ARS answers questions about data holdings relating to acoustics. Its source material includes many previously developed summary files and as such, is probably the best general acoustic reference keyed to oceanographic interests.

Improvements could be attained through better resolution of the TARGET/SIGNAL DETECTION information to be cataloged. Likewise more attention may be deserved for specialized acoustic support surveys; i.e., microstructure, internal waves, detailed sound velocity profiles.

The CREATABASE software module is a proven package, well suited to the needs of an automated bibliography or reference service. The commonality of both the ARS and the LRAPP Data Base within the same software should be an incentive for its use by acousticians.

As a management information subset, the ARS is pledged to rapid response, comprehensive holdings, and an accessible format. The strength of the ARS is its ability to evolve; its ultimate value will depend upon the extent to which it is stimulated by the user community.

References

1. COMNAVOCEANCOM, "Oceanographic Management Information System Sponsor Requirements and Functional Description," draft copy.

2. DONAT, W., LCDR, USN, "Preliminary Users' Guide for OMIS Subsets Under CREATABASE and DMS 1100," April 1979.

3. DANALYT, "User Reference Manual for the CREATABASE Module of an Integrated Data Base Analysis System, Level U-4F," November 1978, with updates for level U-4G.

4. DANALYT, "User Reference Manual for the Graphics Package ... "EGO" Version 1 --- Release 2," June 1977.

5. MAPLES, L.C., "NAVSEA Underwater Acoustic Data Bank," JUA (USN), Volume 25, No. 1, 1975.

6. NORDA, "Introduction to the LRAPP Environmental Acoustic Data Bank," LRAPP Report 79-029, September 1979.

7. NORDA, "Users Manual for Acoustic Reference Service," Enclosure (1) to serial letter 115/038, December 1979.

8. ODSI, "Section 2 of the LRAPP Data Bank Manual," September 1978.

ARS GLOSSARY OF TERMS

1. REPORT CONTROL NUMBER: Serial number for identification of record within data base.

2. SUMMARY SECURITY: Classification of information in record.

3. WORK SECURITY: Classification of data itself

4. MEASUREMENT TYPE 1: Type of acoustic measurement taken; e.g., ambient noise, transmission loss, etc.

5. MEASUREMENT TYPE 2: Type of acoustic measurement taken; e.g., ambient noise, transmission loss, etc.

6. MEASUREMENT TYPE 3: Type of acoustic measurement taken; e.g., ambient noise, transmission loss, etc.

7. MEASUREMENT TYPE 4: Type of acoustic measurement taken; e.g., ambient noise, transmission loss, etc.

8. BEGIN DATE: Year and month measurements started.

9. END DATE: Year and month measurements terminated.

10. S.BOUND: Southern boundary of measurement area considered in this record, in degrees of latitutde. (+=NLat, -=SLat)

11. N. BOUND: Northern boundary of measurement area considered in this record, in degrees of latitude. (+=NLat, -=SLat)

12. W.BOUND: Western boundary of measurement area considered in this record, in degrees of longitude. (+=ELong, -=WLong)

13. E.BOUND: Eastern boundary of measurement area considered in this record, in degrees of longitude. (+=ELong, -=WLong)

14. GENERAL LOCATION: Common geographical name: e.g., Mediterranean Sea.

15. SPECIFIC LOCATION: More specific location name; e.g., Levantine Basin.

16. COGNIZANT PERSON: Person to contact for more information (either author, collector of data or keeper of data library).

17. COGNIZANT ORGANIZATION: Organization which holds the data.

18. COG PHONE: Phone number of cognizant person.

19. SPONSOR ORG: Sponsor organization for the operation (may be different from item 17).

20. FREQUENCY 1: Frequencies at which measurements were taken in Hz.

Glossary (Cont.)

21. FREQUENCY 2: Frequencies at which measurements were taken in Hz.

22. FREQUENCY 3: Frequencies at which measurements were taken in Hz.

23. FREQUENCY 4: Frequencies at which measurements were taken in Hz.

24. RECEIVER 1: Identification of receivers used; e.g., AN/SSQ-57A SONOBUOY.

25. RECEIVER 2: Identification of receivers used; e.g. hydrophone array.

26. RECEIVER 3: Identfication of receivers used; e.g., TSLVA.

27. RECEIVER DEPTH 1: Depth of Receiver 1 in meters.

28. RECEIVER DEPTH 2: Depth of Receiver 2 in meters.

29. SOURCE 1: Sound sources used; e.g., sus charge.

30. SOURCE 2: Sound sources used; e.g., sus charge.

31. SOURCE 3: Sound sources used; e.g., sus charge.

32. SOURCE DEPTH: Depth of Source 1 in meters.

33. ENVIRONMENTAL DATA 1: Other environmental data collected; e.g., sound velocity profile.

34. ENVIRONMENTAL DATA 2: Other environmental data collected; e.g., core.

35. ENVIRONMENTAL DATA 3: Other environmental data collected; e.g., XBT.

36. ENVIRONMENTAL DATA 4: Other environmental data collected; e.g., current.

37. ENVIRONMENTAL DATA 5: Other environmental data collected; e.g., bathymetry.

38. EXERCISE NAME: Common name by which exercise is known; e.g., PARKA.

39. OTHER ID.

40. REFERENCE DOCUMENT.

41. NUMBER OF STATIONS.

42. REVIEW.

43. VLF: Were measurements taken at frequencies less than 10Hz.

44. LF: Were measurements taken at frequencies greater than or equal to 10Hz but less than 100Hz.

45. MF: Were measurements taken at frequencies greater than or equal to 100Hz but less than 1000Hz.

Glossary (Cont.)

46. HF: Were measurements taken at frequencies greater than or equal to 1000Hz but less than 10,000Hz.

47. VHF: Were measurements taken at frequencies greater than or equal to 10,000Hz.

48. MAX WATER DEPTH: Greatest water depth in the operating area in meters.

49. MIN WATER DEPTH: Least water depth in the operating area in meters.

50. MEASUREMENTS: Link of descriptors 4, 5, 6, and 7.

51. ENVIRONMENTAL DATA: Link of descriptors 33, 34, 35, 36, and 37.

52. COORDINATES: Link of descriptors 10, 11, 12, and 13.

APPENDIX A - SAMPLE ENTRANCE

```
 @ASG,A   ARMS*BELL.
FACILITY WARNING  00020000000
 @ADD   ARMS*BELL.WIN
FACILITY WARNING 100000000000
READY
FACILITY WARNING 000200000000
FACILITY WARNING 000200000000
FACILITY WARNING 000200000000
READY
FACILITY WARNING 100000000000
FURPUR27R3B E33 RL73R1 05/23/80 13:17:49
READY
READY
READY
FACILITY WARNING 100000000000
FURPUR27R3B E33 RL73R1  05/23/80 13:17:53
READY
READY
READY
UNPKG 2R1-1078 23 MAY 80 13:18:00
 --  832 SECTORS WERE UNPACKAGED --
UNPKG 2R1-1078 23 MAY 80 13:18:08
 --  896 SECTORS WERE UNPACKAGED --
ARSD
FILE HAS BEEN PREVIOUSLY ASSIGNED (OR FREED)
ARSC
FILE HAS BEEN PREVIOUSLY ASSIGNED (OR FREED)




 DATE 052380 TIME 131815 PAGE 1
THIS IS A DANALYT PROPRIETARY SYSTEM - LEVEL 4G/UNV

MEMO   THIS IS THE OMIS ACOUSTIC REFERENCE SERVICE  *

MEMO   OP-0952 VERSION         LAST UPDATE 16/05/80  *
```

```
 @ASG,TJ   24.,U,8451W
READY
 @ADD   ARMS*DAN.PUSH
FACILITY WARNING  100000000000
READY
FACILITY WARNING  000200000000
FACILITY WARNING  100000000000
FACILITY WARNING  000200000000
FACILITY WARNING  100000000000
FACILITY WARNING  100000000000
FACILITY WARNING  100000000000
FURPUR27R3B E33 RL73R1  06/12/80 09:54:34
READY
READY
READY
READY
READY
READY
READY
READY
READY
UNPKG 2R1-1078 12 JUN 80 09:55:48
 --  960 SECTORS WERE UNPACKAGED  --
UNPKG 2R1-1078 12 JUN 80 09:56:01
 --  1024 SECTORS WERE UNPACKAGED --
ARSD
FILE HAS BEEN PREVIOUSLY ASSIGNED (OR FREED)
ARSC
FILE HAS BEEN PREVIOUSLY ASSIGNED (OR FREED)



DATE 061280 TIME 095613 PAGE1
THIS IS A DANALYT PROPRIETARY SYSTEM - LEVEL 4G/UNV

HOLD=TRUE*

DUPLICATES=FALSE*

ITM (10,11,12,13) FOR WITH

 DATE    TIME       CORE  BUFFERS  RECORDS
060680  154303     46363        5     1610

LF,YES AND 50,AMBIENT NOISE AND 14,NORTH ATLANTIC OCEAN
LF,YES AND 50,AMBIENT NOISE AND 14,NORTH ATLANTIC OCEAN
@ADD   ARMS*DAN.PROTECT
AND NOT (10,UNKNOWN OR 11,UNKNOWN OR 12,UNKNOWN or 13,UNKNOWN)*

ISOLATIONS    TOTAL    PERCENTAGE
        72     1610          4.47

SUBSET BINARY FILE NUMBER   1 HAS     72 RECORDS
```

```
@ADD ARMS*DAN.SUPEREGO
PURGE COMPRESSED FILE

PURGE DESCRIPTORS  10 (10 FROM)
11 (11 FROM) 12 (12 FROM) 13 (13 FROM) *

DMD
LON 910 FROM -180 to 180)
EW (11 CODE 1,2)
LAT (12 FROM -170 to 180)
NS (13 CODE 1,2)*


 DATE     TIME     CORE   BUFFERS   RECORDS
061280   100012   46363         1         0

NUMBER OF FILES ON SUBSET BINARY UNIT     1

      3.194 SECONDS CPU TIME
     10.678 SECONDS I/O TIME

READY
READY


 **** FILE    1 REQUEST  ***

OUTPUT OPTION IS      0
   26    26    -79   -79    26     1     79    2     99
   40    41    -63   -61    40     1     62    2      0
   41    41    -71   -71    41     1     71    2     99
   26    26     80   -80    26     1      0    1      0
   26    26    -80   -80    26     1     80    2     99
   32    32    -64   -64    32     1     64    2     99
   33    36    -67   -62    34     1     64    2      0
   32    32    -64   -64    32     1     64    2     99
   20    20    -58   -58    20     1     58    2     99
   23    23    -62   -62    23     1     62    2     99
   20    20    -58   -58    20     1     58    2     99
   45    50    -40   -40    47     1     40    2      0
   50    65    -50   -35    57     1     42    2      0
   20    33    -80   -64    26     1     72    2      0
   43    47    -13    -3    45     1      8    2      0
   56    66    -17     8    61     1      4    2      0
   20    60    -40     0    40     1     20    2      0
    72 DATA RECORDS OF INPUT FILE  1 WERE PROCESSED - TOTALLING 72 DATA RECORDS
```

```
USET
FILE HAS BEEN PREVIOUSLY ASSIGNED (OR FREED)


 DATE 061280 TIME 100114 PAGE 1
THIS IS A DANALYT PROPRIETARY SYSTEM - LEVEL 4G/UNV

DSQ 10,11,12,13,1 *

 DATE     TIME      CORE   BUFFERS   RECORDS
061280   100012    45991         1         0

CF BINARY *
        72 RECORDS WERE COMPILED AS SPECIFIED

RBU

DUPLICATES=FALSE

SAITM 10,11,12,13,1 FOR WITH *

ISOLATIONS    TOTAL    PERCENTAGE
        72       72        100.00

SUBSET BINARY FILE NUMBER   1 HAS     72 RECORDS

 DATE     TIME     CORE   BUFFERS   RECORDS
061280   100137   45991         1        72


NUMBER OF FILES ON SUBSET BINARY UNIT    1

      2.892 SECONDS CPU TIME
      9.799 SECONDS I/O TIME

FACILITY WARNING  100000000000
READY


 ****  FILE     1 REQUESTED  ***

OUTPUT OPTION IS     0
    72 DATA RECORDS OF INPUT FILE   1 WERE PROCESSED - TOTALLING 53 RECORDS
```

```
 @ADD   ARMS*DAN.ID-NATL
FACILITY WARNING  100000000000
READY



      DANALYT GRAPHICS:  PROGRAM EGO
VERSION     1.0:  UNIVAC 1100, FOR/E.  CALCOMP/936.
RELEASE 3.1        DATE:  78092              EXPIRES:  890228
EXECUTION DATE & TIME:  800612, 100539


      EGO MESSAGES CONCERNING COMMAND #  4

122.-MAXIMUM NUMBER OF CHARACTERS PER LINE OF TEXT:   59
     EXECUTION PROCEEDS.
134.-FILE WORLD        ASSIGNED.                    STATUS:  100000000000
     EXECUTION PROCEEDS.



COMMAND # 4  PROCESSED WITH DATA-SET   1 ON LU 11
                                                TAPE BLOCKS 1 THROUGH 5.
      OMIS ACOUSTIC REFERENCE SERVICE
PLOT TYPE:  MAP.
MAP LIMITS:  LATITUDE, FROM    .000 TO 70.000     LONGITUDE, FROM -92.455 TO  2.455
FIELD:                  1        2        3        4        5
DATA PLOTTED:           0        0       35        0       18
OUT OF RANGE:           0        0        0        0        0
```

APPENDIX C - PRINTER GRAPHICS EXECUTION

```
 @ADD   ARMS*DAN.SET

      1.350 SECONDS CPU TIME
      5.072 SECONDS I/O TIME

READY
FACILITY WARNING  100000000000
FURPUR27R3B E33 RL73R1 05/23/80 13:21;22
END ERS.


 DATE 052380 TIME 132740 PAGE 1
THIS IS A DANALYT PROPRIETARY SYSTEM - LEVEL 4G/UNV

HOLD=TRUE*

ITM 10,11,12,13 FOR WITH
50,AMBIENT NOISE AND 45,YES*

 DATE     TIME      CORE   BUFFERS   RECORDS
051680   140807    46000         5      1585
50,AMBIENT NOISE AND 45,YES*

ISOLATIONS     TOTAL     PERCENTAGE
       218      1585          13.75

SUBSET BINARY FILE NUMBER   1 HAS     218 RECORDS

@ADD   ARMS*DAN.MINI-IND


NUMBER OF FILES ON SUBSET BINARY UNIT     1

      1.763 SECONDS CPU TIME
      5.547 SECONDS I/O TIME


****  FILE     1  REQUESTED ***


OUTPUT OPTION IS      0
   218 DATA RECORDS OF INPUT FILE    1 WERE PROCESSED - TOTALLING  218 DATA RECORDS
```

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